# Frequently Asked Questions Regarding the Salem NJPDES Permit

1) What does the June 29, 2001 New Jersey Pollutant Discharge Elimination System (NJPDES) permit for PSEG-Salem require?

The NJPDES permit issued on June 29, 2001 authorizes the withdrawal of Delaware Estuary water for use in the Salem Station's cooling water processes as well as the discharge. The Department determined that "best technology available" regarding the cooling water intake structure consisted of the following:

- A restriction on intake flow
- Continued use of the modified Ristroph intake screens
- Further improvements to the fish return system
- A study of a multi-sensory hybrid intake protection technology

This permit also required a variety of special conditions where some of the major conditions are as follows:

- Continued restoration of up to 10,000 acres of salt marsh wetlands.
- Implementation of Management Plans for the preservation and/or restoration of more than 18,500 acres of lands, wetlands and uplands including the 4,500 acre Bayside Tract.
- Continued operation and maintenance of eight fish ladders.
- A requirement to construct an additional two fish ladders.
- Continuation of the comprehensive Bay-wide monitoring program of the Delaware Estuary with specific improvements.
- Funding for the construction of artificial reefs.

The goal of the Special Conditions is to continue to reduce fish mortality and increase fish propagation.

This permit also requires continuation of an advisory group (as established in the July 20, 1994 permit) to assist PSEG in continued activities for the most ambitious Special Conditions, namely the restoration of the salt marsh wetlands and the Bay-wide biological monitoring program. Although two advisory groups (i.e. the Management Plan Advisory Group and the Monitoring Advisory Group) were established in the July 20, 1994 permit, the Department has determined it appropriate to merge these two groups into one group, namely the Estuary Enhancement Program Advisory Committee (EEPAC). The EEPAC committee is established in the final June 29, 2001 permit and is comprised of independent scientists, representatives from regulatory agencies and local representatives.

A detailed comparison of the Special Conditions requirements in the June 29, 2001 NJPDES permit as compared to the July 20, 1994 NJPDES permit is included as Table 1.

2) How was the public notified of the issuance of the December 8, 2000 draft permit and the June 29, 2001 final permit by DEP?

DEP provided notice of the issuance of the December 8, 2000 draft permit action in the December 27, 2000 DEP Bulletin. DEP also provided public notice in *Today's Sunbeam* and the *Daily Journal* along with dates and times for the scheduled public hearings. The draft permit Fact Sheet, public notice and ESSA report (i.e. the Department's contractor) were available on this Division of Water Quality web site. Copies of the draft permit were also available for review at the Newark Public Library, Cumberland County Library, Salem Free Library and the NJDEP Public Access Room.

Public hearings were conducted on January 23, 2001 at Pennsville Memorial High School in Salem County and on January 25, 2001 at Cumberland County Community College in Cumberland County. The Department accepted written comments on the draft permit action up until March 14, 2001.

The Department mailed a complete copy of the final permit to any persons who prepared written comments and/or submitted oral testimony at one of the public hearings. All comments submitted were summarized and responded to in the final NJPDES permit issued by the Department.

3) How many acres have been acquired, restored or preserved to comply with the wetlands restoration program conditions included in the NJPDES permit? What types of lands are these?

In response to the wetlands restoration requirements of the July 20, 1994 permit, the permittee established the Estuary Enhancement Program (EEP). The EEP has acquired, preserved or restored a significant amount of acreage in and around the Delaware Estuary (see Figure 1 for locations of these sites). Because of the specific conditions included in the 1994 permit related to the wetlands restoration requirements, where these requirements were retained in the June 29, 2001 final permit, the amount of acreage creditable for the purposes of the NJPDES permit is different from the amount of acreage acquired, preserved or restored. A summary of this acreage is as follows:

| **Site** | **Total Acreage** | **Total Acreage Creditable To Permit** |
|---|---|---|
| Formerly Diked Salt Hay Farms | | |
| **Dennis**: Wetlands | 369 | 369 |
| **Dennis**: Upland Buffer | 15 | 5 |
| **Maurice River Township**: Wetlands | 1135 | 1135 |
| **Maurice River Twp.**: Upland Buffer | 108 | 36 |
| **Commercial**: Wetlands | 2894 | 2894 |
| **Commercial**: Upland Buffer | 339 | 113 |
| | | |
| Phragmites-dominated Lands | | |
| **Alloways**: Wetlands | 2813 | 2813 |
| **Alloways**: Upland Buffer | 220 | 73.33 |
| **Cohansey:** Wetlands | 910 | 455 |
| **Cohansey**: Upland Buffer | 145 | 48.33 |
| **The Rocks** and **Cedar Swamp** | 2599 | 2000 |
| **Other Delaware Sites** | 1739 | 0 |

| | | |
|---|---|---|
| Other Wetlands and Upland Buffer | | |
| **Bayside Tract:** Wetlands | 2585 | 0 |
| **Bayside Tract :** Upland Buffer | 1822 | 607.33 |
| TOTAL | 17,693 acres | 10,549 acres |
| Other Lands Within Site Boundaries | 1374 | |
| Other DNREC Lands | 1452 | |
| | 20,520 acres | |

The permittee was required to acquire and/or restore a total of 10,000 acres of lands comprised of formerly diked salt hay farms; Phragmites-dominated lands or upland buffer (where upland buffer is creditable at a 3:1 ratio). The Department has determined that 10,549 acres are creditable towards this 10,000 acre requirement, therefore the permittee is in compliance. The permittee was also required to preserve the existing wetlands at the Bayside Tract along with the upland buffer land at this site. To date, the permittee has restored, acquired and/or preserved over 20,500 acres making this the largest privately funded restoration in the world, to the Department's knowledge.

4) Did the public submit comments on the wetlands restoration conditions?

During the public comment period, the Department received extensive written comments as well as public testimony at the January 23 and January 25, 2001 public hearings. Many interested parties commented specifically on the wetland restoration requirements and the EEP. While many commentors praised the environmental benefits of the wetlands restoration program, some commentors expressed specific concern regarding the continued need to use herbicides to meet restoration goals for portions of the Alloways Creek site.

Given this concern, the Department would like to note one significant change in the Administrative Record pertaining specifically to this issue that has occurred since the end of the public comment period on March 14, 2001. By way of a letter dated June 8, 2001, PSEG informed the Department of its decision to make certain changes to the restoration program for the Alloways Creek site. Specifically, PSEG stated that it would cease utilizing herbicides for the management of approximately 1,000 acres of the western portion of the Alloways Creek site; retain these 1,000 acres of Phragmites-dominated wetlands; and purchase approximately 1,000 additional acres to ensure compliance with the permit conditions. The Department intends to pursue implementation of this decision.

5) How are the restoration goals determined? Is PSEG in compliance with the vegetative and hydrological criteria at all these sites? At what date do these sites have to meet the final success criteria?

As required in the existing NJPDES permit, all the EEP sites are required to have Management Plans issued by the Department's Land Use Regulation Program. The Management Plans set forth restoration goals in the form of vegetative and hydrological success criteria where a

separate plan is developed and approved by the Department's Land Use Regulation Program for each site. The Management Plans are separate regulatory documents than the NJPDES permit.

The restoration of the wetlands sites is ongoing and not yet complete. The dates for compliance are as follows:

| | Completion of Restoration Implementation Action | Interim Vegetative Criteria | Final Success Criteria |
|---|---|---|---|
| MRT | March 1998 | October 2004 | October 2009 |
| Dennis | October 1996 | October 2003 | October 2008 |
| Commercial | November 1997 | October 2004 | October 2009 |
| Alloways | September 1999 | October 2005 | October 2011 |
| Cohansey | September 1999 | October 2005 | October 2011 |
| The Rocks | June 2000 | October 2005 | October 2011 |
| Cedar Swamp | June 2000 | October 2005 | October 2011 |

Compliance with the interim and final success criteria is determined by the Department's review of aerial photography. Currently, the permittee is in compliance with the approximate 9% coverage of Spartina and other desirable marsh vegetation per year.

5) What is the goal of the wetlands restoration program? Why is the Department encouraging the removal of Phragmites at the Alloways Creek and Cohansey, and Delaware Wetland Restoration Sites?

PSEG was required through Management Plans approved by the Department to take steps to return diked lands (i.e. Maurice River Township, Commercial Township, Dennis Township) to desirable vegetation as well as to restore degraded Phragmites-dominated wetlands (i.e. Alloways, Cohansey, The Rocks and Cedar Swamp). The ultimate goal of the wetlands restoration program is to restore these diked or Phragmites-dominated wetlands to Spartina wetlands. These wetlands will serve as a source of nourishment for fish in the bay; serve as a nursery for fish; and serve as valuable habitat for the diverse population of wildlife found in Delaware Estuary marshes. These environmental benefits will long outlast the life of the Salem Generating Station.

Four of the eight PSEG sites were phragmites-dominated where the reduction of phragmites is progressing. Phragmites is an aggressively invasive marsh plant which grows in large dense stands. Phragmites often outcompetes or "chokes out" other vegetation forming a monoculture and effectively eliminating vegetation diversity. Large Phragmites marshes support food webs that are different from those of desirable vegetation (such as Spartina alterniflora) or of marshes with other diversified estuarine wetland vegetation.

Phragmites affects habitat by enhancing sediment deposition within the stand. The dense stems and plant litter slow water velocity and reduce the ability of water to carry sediment. Particles settle amongst the litter. This elevates the marsh plain making less land available to tidal inundation and hence less available living space or habitat for fish. In addition, Phragmites stands decompose slowly which act to shade the soil surface thereby restricting algal productivity. Again, the goal of the wetland restoration sites is to increase fish production.

Phragmites removal and replacement by desirable species will result in an increase in habitat and algae productivity which is more beneficial to fish production than Phragmites-dominated lands.

The limited animal species that may use Phragmites as habitat will usually use other vegetative habitat as well. These species that use Phragmites as habitat usually do so at its border or edges. Phragmites reduction is not expected to have adverse effects on these species.

6) Does the proposed draft permit authorize the use of glyphosate at the wetlands restoration sites?

No. To receive permission to apply glyphosate, the permittee must apply to the Department's Land Use Regulation Program for a land application permit or permit modification. This permit is a separate regulatory document than the NJPDES permit.

The Department continues to encourage minimization of the use of glyphosate on the wetland restoration sites. Once the proper hydrological regime is established in an affected area, the Department's goal is for native wetland vegetation such as Spartina alterniflora to outcompete Phragmites. In the event that the Department determines that a repetitive application of glyphosate is the only available method for Phragmites control, PSEG will be required to eliminate the "failed" acreage from the program and to provide other wetland or upland acreage to meet the NJPDES permit requirements.

7) Is PSEG required to produce the same number of fish on the preserved or restored wetlands that are being lost at the intake structure?

In its 1994 permit, the Department determined that PSEG's voluntary proposal to restore or enhance a minimum of 10,000 acres of wetlands in the Delaware River Basin would further minimize the effects of Station-related operations. This acreage value was intended to increase detrital production (finely divided particulate matter available for consumption by aquatic life) to the Delaware Estuary as well as provide additional fish habitat. This acreage value was not intended to replace the losses at the intake structure at a one to one ratio. The Department reaffirmed this acreage value in its July 29, 2001 final permit.

However, the permittee did provide analyses in its application to estimate the range of numbers of fish produced on the formerly diked wetland restoration sites. Due in part to the fact that the permittee continues to make general statements about the level of fish productivity from wetlands restoration as a factor in fish population trends, the Department has determined that the quantification of fish production is important in a general sense. Therefore, the Department included a requirement in the June 29, 2001 permit to require the permittee to provide estimated production levels at the wetland restoration sites. Again, it is important to note that these sites are still evolving and not yet complete which has a bearing on the production amounts.

8) What are the fish ladders and what are they expected to do?

Because of manmade obstructions such as dams in streams and rivers, river herring populations have been negatively affected since they can not migrate. River herring migrate in the spring

from the ocean and bay into freshwater rivers and lakes to spawn. In the fall, the young migrate downstream and out to the ocean where they remain until they return as adults to their natal spawning grounds. A fish ladder is designed as a conveyance structure to allow the fish to get past the manmade obstruction to upstream reaches of the waterbody. Fish ladders therefore help river herring move into lakes and beyond to spawn and, over time, help species rebuild their historic population levels. PSEG has installed a total of 8 fish ladders thus far as part of its EEP where the June 29, 2001 NJPDES permit requires installation of two additional fish ladders.

9) What is the difference between the modified intake screens and the previous intake screens? Are the modified intake screens improving fish mortality rates associated with impingement?

The most significant differences are that the modified screens (installed in 1995) have smaller and less injurious openings with specially designed buckets. These buckets help to reduce fish mortality by suspending the fish in a curved lip that reduces injury prior to release to the Delaware Estuary via a fish return flume. As recommended to the Department by its contractor ESSA, the Department is requiring further analysis and potential redesign of the fish return flume to further enhance the effectiveness of the modified screens.

10) Who reviewed the March 4, 1999 renewal application? Did anyone from the Department check out the site and inspect the things that PSEG claimed to have done?

Numerous staff and management representing different Department divisions joined together as a team to review the PSEG application and inspect the PSEG wetland restoration sites. This includes the Department's Division of Fish and Wildlife, Land Use Regulation Program, the Attorney General's office and the Division of Water Quality. Although the Department has the requisite expertise to review the application in-house, the Department determined that it would be beneficial to hire a contractor to assist in its review of certain aspects of the application. Therefore, the Department contracted with ESSA Technologies of Richmond Hill, Ontario to review and verify certain data, analyses and conclusions contained in the application.

Again, as established under the July 20, 1994 NJPDES permit, the Management Plan Advisory Committee (MPAC) and the Monitoring Advisory Committee (MAC) were established to serve as a body to provide technical advice concerning the ongoing implementation of the Management Plans for the wetland restoration sites, in the case of the MPAC, and the biological monitoring program, in the case of the MAC. This technical oversight will continue under the terms of the renewal permit, although the MPAC and MAC have been merged under one committee called the EEPAC.

11) What portions of the application did the contractor review and how much did it cost? Who will pay the bill?

The contractor reviewed those sections of the application associated with the withdrawal of intake water through the Salem Station. This includes impingement and entrainment effects, intake protection technologies, fishery economics, fish population dynamics and trends, and biostatistics. Impingement occurs when aquatic life is impinged or "gets stuck" on the intake screens whereas entrainment is the effect of aquatic organisms being withdrawn through the

plant and eventually discharged. The price of the contract was $339, 289. As authorized under the NJPDES Regulations, PSEG was required to reimburse the Department as part of its NJPDES permit fee for the contractor expenses incurred.

12) Where can I find information concerning the number of losses at the intake structure?

The Department requires that the number of losses due to entrainment and impingement be reported. This information is part of the NJPDES application and is broken down for each Representative Important Species for specific life stages. Please contact the Department's Central File Room at (609) 292-0400 if you wish to make an appointment to review the application.

It is important to note that the Department views the term "adverse environmental impact" in the context of the Clean Water Act as meaning the loss of one fish through a cooling water intake structure. In other words, in the Department's view it is irrelevant whether the losses at an intake structure include one fish or a million fish. Either way the Department requires the permittee to implement any technological measures for which the costs are not wholly disproportionate to the environmental benefits.

US EPA recently issued rules for Section 316(b) (which concerns the best technology available at cooling water intake structures) in draft format for new facilities. A facility such as Salem is considered an existing facility where those rules are not currently due out until 2002. In the 316(b) rules for new facilities, EPA did not include a definition for adverse environmental impact. Therefore, the Department's policy of applying the loss of one fish being equivalent to an adverse environmental impact for both new and existing facilities is more conservative than these recently issued EPA rules for new facilities.

**Table 1**

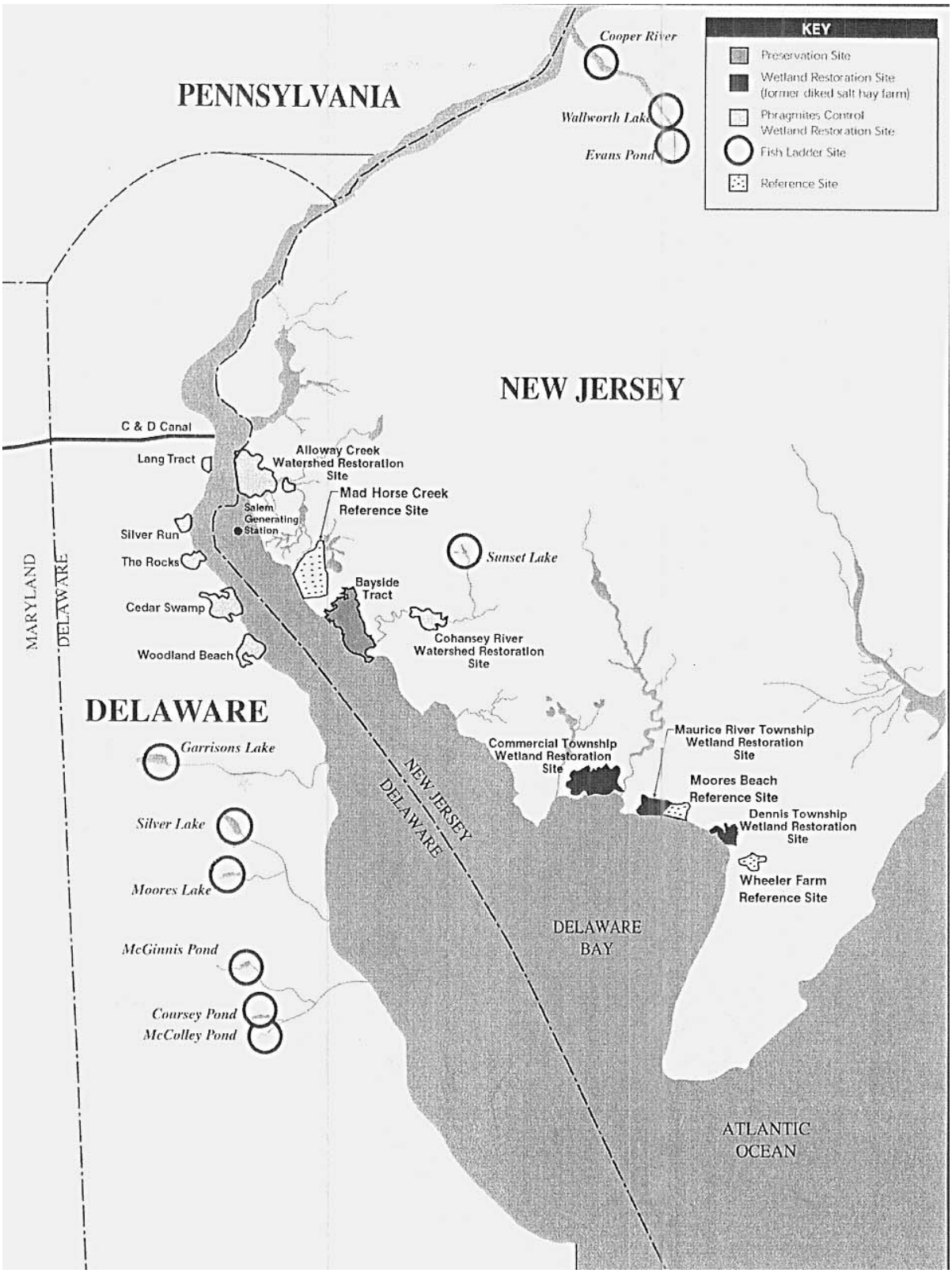
## Comparison of Section 316 Special Conditions in the July 20, 1994 Permit Versus Section 316 Special Conditions in the June 29, 2001 Permit

| Section 316 Special Condition in the July 20, 1994 Permit | Special Condition Retained in June 29, 2001 Renewal Permit? |
|---|---|
| Intake Flow Limit and Dye Tracer Evaluation | Yes |
| Intake Screen Modifications | Modified to require further study and enhancements to the fish return system. |
| Wetlands Restoration and Enhancement | Modified to continue with wetlands restoration and enhancement efforts – requirements included for any "replacement acreage" deemed necessary. |
| Installation of Fish Ladders | Modified to continue monitoring of adult and juvenile passage and stocking. Modified to require construction of two additional fish ladders. |
| Sound Deterrent Study | Modified to require further study of a multi-sensory hybrid system which shall include sound |
| Biological Monitoring Program | Modified to require improvements to the biological monitoring program. Until such time as improvements are proposed, program shall continue. |
| Financial Assurance Requirements | No – No longer applicable |
| Force Majeure | No – No longer applicable |
| Submission of all Documents | Yes |
| Termination of Section 316(a) Variance/Penalties | Yes |
| Information Required to be Submitted as part of a Section 316(a) Variance Request and Section 316(b) Determination | Retained for any Future NJPDES Renewal Application. |

## NEW Section 316 Special Conditions

| Section 316 Special Condition in the Jun 29, 2001 Renewal Permit |
|---|
| Designation of Estuary Enhancement Oversight Committee Members |
| Entrainment and Impingement Abundance Monitoring shall continue until an Improved Biological Monitoring Program is Developed |
| Expansion of Analysis regarding Losses at the Station |
| Expansion of Analysis regarding Entrainment Sampling |
| Study of the Hydrodynamics at the Intake |
| Study of Enhancements to Entrainment and Impingement Sampling |
| Intake Protection Technology Reopener Clause |
| Estimates of Production of the Wetland Restoration Sites and Fish Ladders |
| Funding of Artificial Reefs |

**Figure 1 - map**


KEY
Preservation Site
Wetland Restoration Site (former diked salt hay farm)
Phragmites Control Wetland Restoration Site
Fish Ladder Site
Reference Site
PENNSYLVANIA
NEW JERSEY
DELAWARE
MARYLAND
DELAWARE
Cooper River
Wallworth Lake
Evans Pond
C & D Canal
Lang Tract
Alloway Creek Watershed Restoration Site
Mad Horse Creek Reference Site
Salem Generating Station
Silver Run
The Rocks
Cedar Swamp
Woodland Beach
Sunset Lake
Bayside Tract
Cohansey River Watershed Restoration Site
Garrisons Lake
Silver Lake
Moores Lake
McGinnis Pond
Coursey Pond
McColley Pond
NEW JERSEY
DELAWARE
Commercial Township Wetland Restoration Site
Maurice River Township Wetland Restoration Site
Moores Beach Reference Site
Dennis Township Wetland Restoration Site
Wheeler Farm Reference Site
DELAWARE BAY
ATLANTIC OCEAN